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A CASE OF MISTAKEN IDENTITY AND DISCOVERY OF A NEW METAL MARK (CALEPHELIS) FROM MICHIGAN (LEPIDOPTERA, RHODINIDAE).

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For many years in Michigan and nearby territory, a little metal-mark butterfly has been mistaken for *Calephelis borealis* (Grote & Robinson).

Recently life history work on *Calephelis borealis* (Grote & Robinson) by Cyril F. dos Passos of Mendham, N. J., and on the Michigan *Calephelis* by the author, together with comparison of series of both butterflies and others in the same genus, has revealed that the Michigan *Calephelis* is not *borealis*, but apparently an undescribed species.

The author proposes the name of *Calephelis muticum*, for this species, after its food plant *Cirsium muticum*, the swamp thistle.

Calephelis muticum n. sp. (fig. 1 to 7 inc. Plate XX).

Male: Expanse holotype 1.00 inches, average of 29 paratypes 0.95 in., smallest 0.86 in., largest 1.03 in.

Upper surface: Head with a dark brown patch at top, balance of top and front fulvous (tawny, reddish, yellow, approaching orange), while palpi are of a slightly paler fulvous color. The eyes are dark purplish. Antenna black with white rings at joints, club rather long and faintly tipped with reddish brown.

Dorsal surface of thorax and abdomen fuscous (dark brown, approaching black) with lighter reddish brown scales along segmental sutures on sides of abdomen. There are fuscous scales along veins of both wings being more numerous on basal half of wings.

Upper surface of wings a rich bright mahogany color, clouded with fuscous at base of wings, along three fourths of costal margin (except at front base), and along inner margin

of both wings. At front base of costal margin and front of patagia there is a dash of fulvous color. On the basal half of both wings there is a series of rather fine black linear markings which form four or five irregular transverse lines that are more or less concentric with base of the wings, giving that portion of the wings a darker appearance. In most specimens there are some fuscous scales preceding the most outward of the black transverse lines. These scales are more numerous on the forewing near center but the quantity of such scales is very variable in different specimens and in some examples are well scattered over basal half of wing. Beyond the outer transverse line are the two, rather fine, silver metallic lines, between which are a row of fairly prominent black dots. The metallic lines are margined with black, the outer line being continuous, close to, and equidistant from edge of the wings while the inner one is less continuous and more irregular, being considerably exserted at center of wings particularly so in forewings. The silver metallic lines though rather fine are well defined and conspicuous. In most specimens the ground color of the wings between the inner metallic line and edge of wing is of a lighter and brighter color.

Under surface: The legs and under surface of wings, thorax and abdomen are of a fairly uniform fulvous color. The basal markings which correspond in position with those that form the concentric transverse lines of the upper surface are quite fine and disconnected and are all of about the same weight.

The silver markings of the upper side are repeated, only are much heavier and have little or no black margins. The outer metallic line is continuous, while the metallic spots of the inner line are disconnected and somewhat round or square in shape, particularly on the primaries. There are three or four fine metallic markings along the costa preceding the inner metallic line. The dots between the two transverse metallic lines are repeated on the underside.

Female: Expanse allotype 1.00 inches, average of 13 paratypes 0.97 in., smallest 0.88 in., largest 1.05 in.

Very similar to male in markings and color of wings except that the markings are inclined to be heavier and the color a little deeper. The primaries are more rounded than in the male. The fringe sometimes has a very faint check of whitish at apex and inner angle of primaries. A trace of these spots is less often noted on male specimens.

A comparison of the three species, *muticum*, *borealis* and *virginensis* reveals that *muticum*, in both sexes, is very similar in markings, color and shape to *virginensis*, the main difference being in size. Small specimens of *muticum* which sometimes occur in nature are very difficult to separate from *virginensis* without examination of the genitalia. The color of the upper surface of *muticum*, in most specimens is darker than in *virginensis*, although this varies a great deal, and some specimens match well. *Calephelis virginensis* has the proportions of a smaller insect than either of the other species, while *muticum* averages slightly smaller than *borealis*. A series of specimens of *virginensis* averages male 0.79 in. in wing expanse, female 0.83 in., while a series of specimens of *borealis* averaged male 0.97 in. and female 1.06 in. and as noted before, a series of *muticum* averaged male 0.95 in. and female 0.97 in. in wing expanse.

Fresh specimens of *borealis* can usually be distinguished from either of the other species by the very dark and dull color of upper surface, which is covered with fuscous scales, there being usually a decided black transverse band across both wings near central area, preceding, and being part of, the outer basal transverse irregular line. The finer markings which form the other basal transverse lines are very obscure due to the fuscous scale covering of wings. This scale covering, except on the dark bands, is easily rubbed off, and flown specimens naturally appear lighter than freshly emerged ones. The silver markings of upper surface of *borealis* are faint and inconspicuous while the interspacial black dots are large and prominent. The ground color of wings of *borealis* is dark brown, and where rubbed yellowish, while fringes are also darker than in *muticum*. In *borealis* the fringes are usually faintly checkered with white at apex and inner angle of primaries, while this is not usually noticeable in *muticum*, and was not noted in *virginensis* at all.

The under surfaces of all three species are quite similar in color, although *borealis* is inclined to have a redder flush on outer primaries, particularly in male specimens. The markings of the inner metallic line of *borealis* are more connected, straighter and more crescent-shaped than in the other two species, while the costal fine metallic markings preceding the inner metallic line are subobsolete as noted by Grote & Robinson. In *borealis* the disconnected markings of the outer basal transverse line near center of wings, are heavier than the other basal markings and more continuous and prominent than in the other species.

The neuration of the three species is similar.

As noted in the illustrated figures the male genitalia are distinct in shape in the three species. The pointed end of the upper anellus in *muticum* easily separates it, while the armature of the harpé in *virginensis* is very different from the others.

Type localities: Willis, Washtenaw Co., Mich.; Mahopac and Bloomfield Hills, Oakland Co., Mich.; Champaign Co., Ohio; Willard, Missouri, and Milwaukee, Wis.

Types: Holotype male, Willis, Washtenaw Co., Mich., to be sent to U. S. National Museum; allotype female, Mahopac, Oakland Co., Mich. to be sent to U. S. National Museum. Fifteen male and two female paratypes from Willis, Washtenaw Co., Mich.; 8 male and 4 female paratypes from Mahopac, Oakland Co., Mich.; 1 male and 2 female paratypes from Bloomfield Hills, Oakland Co., Mich.; 3 male and 3 female paratypes from Willard, Missouri; 1 male and 1 female paratype from Champaign Co., Ohio, and 1 male and 1 female paratype from Milwaukee, Wis.

Part of these will be distributed to museums.

Calephelis borealis (G. & R.), according to Cyril F. dos Passos in Canadian Entomologist of August, 1936, is found on high ground, in open woods, along limestone outcroppings, where its food plant, *Senecio obovatus*, occurs. *Calephelis muticum* is found on low ground along spring fed streams, or in the swamps and bogs where its food plant, the swamp thistle, occurs. Nothing as yet is known regarding the life history of *C. virginensis*.

Calephelis muticum may have considerable range as its food plant is found from Florida to Texas in the south, to Saskatchewan and Newfoundland in the north, according to "Manual of the South-eastern Flora," by John K. Small, 1933, although an examination of so-called *C. borealis* series in several of the large Eastern museums reveal almost 100% of the specimens to be true *borealis*, usually from Virginia, Pennsylvania, New York, New Jersey, and southern Ohio, which would perhaps indicate that its range is rather limited after all.

Through cooperation of several Lepidopterists and museums, the present range of *C. muticum* is recorded. The author has seen and examined specimens of so-called *C. borealis* which have proved to be *C. muticum* from Chicago, Illinois, and Milwaukee, Wis., areas, in collection of Alexander K. Wyatt, of Chicago; and from Champaign County, Ohio, in collection of Ohio State University Museum, through courtesy of Mr. Edwin Thomas, and from Willard, Missouri, area, in collection of Dr. A. E. Brower, of Bar Harbor,

Maine. *Calephelis muticum* has also been taken by several Lepidopterists in the Detroit area, Dr. W. W. Newcomb, Dr. Geo. W. Rawson, Sherman Moore, Walter Stinson and the author within a radius of thirty-five miles northwesterly and westerly from Detroit, Mich., where it has been found fairly common in certain small swampy areas. It has also been taken by the author in a Cass County tamarack swamp in the southwestern part of Michigan.

Dr. A. E. Brower sent me a series of thirteen *Calephelis* collected by him at Willard, Missouri, about the middle of August, 1926, which prove to be *Calephelis muticum*. He wishes to call attention to the erroneous recording of these as *Calephelis borealis* in his article in the Canadian Entomologist of April, 1929.

Dr. W. W. Newcomb recorded *C. borealis* from Michigan in his check list of Michigan Lepidoptera in the Fourteenth Report of the Michigan Academy of Science in 1912, but this also should be corrected to read *C. muticum*.

Mr. Robt. H. Wolcott published a list of Butterflies of Grand Rapids, Michigan, in the Canadian Entomologist of April, 1893, in which *C. borealis* is listed and mentions it as being found in low wet grassy areas near Lambert Lake. Unfortunately, the whereabouts of Mr. Wolcott's collection is unknown, but there is little or no doubt that the species he refers to is *C. muticum*.

There is no authentic record of *C. borealis* for Michigan to my knowledge. The only present known apparent overlapping range of *C. borealis* and *C. muticum* is near Columbus, Ohio, where Mr. Edwin Thomas has taken *borealis* near Columbus and in the Cincinnati, Ohio, area under conditions similar to which Mr. dos Passos found it in New Jersey, and has also taken *muticum* in a cedar swamp in Champaign Co., Ohio, which is about 40 miles westerly of Columbus.

A comparison of life histories of *C. borealis* and *C. muticum* show they are quite similar in most respects, although the food plants and habitat as noted before are different. Both are single brooded.

C. borealis usually flies during the early part of July, while *C. muticum* flies during the latter part of July and early part of August. The egg, larval stages and chrysalis are very much alike in both species. The author made life history observations on *C. muticum*, believing he was dealing with *C. borealis* as far back as 1915 and 1916 and later on in 1930 and 1931 completed its life history. This detailed life history will appear in a latter issue of the BULLETIN.

The author is indebted to C. F. dos Passos who has given every assistance and has provided specimens of imago, egg, larvae in various stages and chrysalis of *Calephelis borealis* for comparison, to J. F. Gates Clarke and the National Museum for aid in identification and loan of specimens., to the University of Michigan Museum for loan of specimens and literature, and to the Carnegie Museum, Dr. W. W. Newcomb, Geo. P. Engelhardt and Wm. J. Gertsch for assistance and gift or loan of specimens of allied species.

In the accompanying Plate I, the male specimen of *C. borealis* as figured is from Newton, N. J., which is close to the type locality "near Upper Coldenham, Orange, Co., N. Y.," while the female specimen as figured is from Rockview, Pa., not far distant. These agree very well with original description by Grote & Robinson as recorded in Annals of N. Y. Lyceum of Natural History, Vol. 8, p. 351, in 1866, and with series of specimens seen by the author in various museums and private collections. An effort was made to locate types or paratypes, but without avail. The figures of *C. virginensis* are from specimens in the Barnes Collection, U. S. National Museum, the same specimens being used by Barnes and McDunnough in their illustration of *C. virginensis*, Plate XII, figures 11 and 13, Vol. 4. "Contributions to the Natural History of the Lepidoptera of North America." These specimens also agree well with original descriptions and series of specimens examined by the author in various collections.

EXPLANATION OF PLATE I.

Figures actual size, except genitalia which are of a constant enlargement of twenty diameters.

Photos by Fenton Coombs, retouched by W. S. McAlpine.

Drawings by W. S. McAlpine.

- Fig. 1. *Calephelis muticum* n. sp., upper side, ♂, holotype, Willis, Washtenaw Co., Mich., July 12, 1936 (W. S. McAlpine), U. S. National Museum.
- " 2. *Calephelis muticum* n. sp., upper side, ♀, allotype, Mahopac, Oakland Co., Mich., July 24, 1932 (W. S. McAlpine), U. S. National Museum.
- " 3. Same as Fig. 1, underside.
- " 4. Same as Fig. 2, underside.
- " 5. Neuration of *Calephelis muticum* n. sp., ♂, paratype, Mahopac, Oakland Co., Mich., July 24, 1932 (W. S. McAlpine), in author's collection.

- “ 6. Side view genitalia of *Calephelis muticum* n. sp., ♂, paratype, Willis, Washtenaw Co., Mich., July 12, 1936 (W. S. McAlpine), U. S. National Museum.
- “ 7. Top view with upper organs removed, genitalia of *Calephelis muticum* n. sp., ♂, paratype, Willis, Washtenaw Co., Mich., July 11, 1931 (W. E. Stinson), U. S. National Museum.
- “ 8. *Calephelis borealis* (Grote & Robinson), upperside, ♂, Newton, N. J., July 3, 1934 (C. F. dos Passos), in author's collection.
- “ 9. *Calephelis borealis* (Grote & Robinson), upperside, ♀, Rockview, Penn., July 12, 1936 (W. J. Gertsch), in author's collection.
- “ 10. Same as Fig. 8, underside.
- “ 11. Same as Fig. 9, underside.
- “ 12. Top view with upper organs removed, genitalia of *Calephelis borealis*, ♂, Rockview, Penn., July 12, 1936 (W. J. Gertsch), in author's collection.
- “ 13. *Calephelis virginensis* (Gray), upperside, ♂, Fort Meyers, Fla., Apr. 16, 1923 (Barnes Collection), U. S. National Museum.
- “ 14. *Calephelis virginensis* (Gray), upperside, ♀, Fort Meyers, Fla., May 1, 1907 (Barnes collection), U. S. National Museum.
- “ 15. Same as Fig. 13, underside.
- “ 16. Same as Fig. 14, underside.
- “ 17. Top view with upper organs removed, genitalia of *Calephelis virginensis*, ♂, Fort Lauderdale, Broward Co., Florida, Aug. 22, 1925 (D. M. Gates), in author's collection.